Name: Date:

Polynomial Factoring solution (version 611)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 40 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(40)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 160}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-96}}{2}$$

$$x = \frac{-8 \pm \sqrt{-16 \cdot 6}}{2}$$

$$x = \frac{-8 \pm 4\sqrt{6}\, i}{2}$$

$$x = -4 \pm 2\sqrt{6}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 - 5i$ and $-4 - 7i$ in standard form $(a + bi)$.**

Solution

$$(-8 - 5i) \cdot (-4 - 7i)$$

$$32 + 56i + 20i + 35i^2$$

$$32 + 56i + 20i - 35$$

$$32 - 35 + 56i + 20i$$

$$-3 + 76i$$

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3. **Write function $f(x) = x^3 + 3x^2 - 22x - 24$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	3	-22	-24
-6		-6	18	24
	1	-3	-4	0

$$f(x) = (x + 6)(x^2 - 3x - 4)$$

$$f(x) = (x + 6)(x + 1)(x - 4)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 6)^2 \cdot (x + 2)^2 \cdot (x - 1)$$

Sketch a graph of polynomial $y = p(x)$.